

NON-PUBLIC?: N
ACCESSION #: 9012050132
LICENSEE EVENT REPORT (LER)

FACILITY NAME: Monticello Nuclear Generating Plant PAGE: 1 OF 4

DOCKET NUMBER: 05000263

TITLE: Reactor Scram Caused by Bumping Instrument Sensing Line
EVENT DATE: 10/29/90 LER #: 90-017-00 REPORT DATE: 11/28/90

OTHER FACILITIES INVOLVED: DOCKET NO: 05000

OPERATING MODE: N POWER LEVEL: 100

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR
SECTION:
50.73(a)(2)(iv)

LICENSEE CONTACT FOR THIS LER:
NAME: Russ VanDell TELEPHONE: (612) 295-1326

COMPONENT FAILURE DESCRIPTION:
CAUSE: SYSTEM: COMPONENT: MANUFACTURER:
REPORTABLE NPRDS:

SUPPLEMENTAL REPORT EXPECTED: NO

ABSTRACT:

A reactor scram occurred from 100% power due to a spurious reactor high pressure signal which activated both channels of the reactor protection system high pressure scram logic. Subsequent investigation revealed that workers had been moving scaffolding in the immediate area of the A safeguards sensing line which is common to the activated switches. Follow-up testing demonstrated that a relatively small external impact on the sensing line at the work location creates a hydraulic shock in the sensing line sufficient to trip the pressure switches. The cause of this event was failure to recognize and identify the sensitivity of the sensing line to bumping. Work in the area of both A and B sensing lines was restricted by placing signs on the sensing line and installing physical barriers. Scaffolding and other equipment was removed from the sensing line areas prior to startup. Painting in the areas was postponed until the next scheduled refueling outage and painting and scaffolding procedures were revised to identify sensitive instrument lines.

END OF ABSTRACT

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DESCRIPTION

At 1032 CST on October 29, 1990, a reactor scram occurred from 100% power. Reactor protection system (EHS System Code: JC) trips from both A and B channels were activated when reactor high pressure switches (EHS Component Code: PS) sensed a spurious high pressure signal. No scram surveillance tests were in progress at the time. All systems involved in the event were considered operable and operated as designed. The plant was in a stable condition at all times. Actions for scram recovery were accomplished in accordance with existing procedures. No other systems, structures, or components were inoperable or contributed to this event. This event is reportable because it involved an automatic actuation of the Reactor Protection System.

CAUSE

Post scram investigation and testing concluded that the reactor scram was caused by actuation of the reactor high pressure scram switches (PS-2-3-55A and PS-2-3-55B) as identified by the plant process computer sequence of events. These pressure switches were actuated by a spurious high pressure spike in the sensing line shared by both switches. Records identified work in an area of the sensing line on the floor above the switches but no work being done in the area of the instrument rack. The workers agreed that it was indeed possible that the line was bumped as painting and scaffolding activities were in progress at the time the reactor scram occurred.

Follow-up testing demonstrated that a relatively small external impact on the sensing line at the work location creates a hydraulic shock in the sensing line sufficient to trip the pressure switches. Further, testing showed that the sensitivity to external impact of the sensing line in the suspect area of the line is at least as great as at the instrument rack where the switches are mounted. As further evidence, the time response as characterized by the various monitoring systems (computer sequence of events, annunciators, and relay actuations) was consistent between the actual plant trip and the trips performed during the post-trip testing. The calibration of the pressure switches was confirmed.

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The sensing lines were installed in 1986 as part of the reactor water level cold reference leg modification. At the time of installation, the

sensitivity of the sensing lines to external impacts was not known. Therefore, existing painting and scaffolding procedures did not identify the new lines as sensitive equipment. The cause of the event was failure to recognize and identify the sensitivity of the sensing lines to bumping. There were no cognitive errors associated with this event.

ANALYSIS

This event represents an unnecessary challenge to the Reactor Protection System and an additional transient for plant equipment. Scram from 100% power is an analyzed event. The event occurred under the worst possible set of initial conditions.

All affected systems functioned as designed. There was no threat to the public safety, degradation of any system which affected public safety, or departure from previously analyzed plant condition or status.

CORRECTIVE ACTIONS

Immediate actions were taken for scram recovery in accordance with existing procedures.

Prior to startup, scaffolding and other items were removed from the area of both A and B sensing lines. Work in the area has been restricted by placement of physical barricades and installation of signs on the sensing lines. The signs provide warning of the potential to cause scrams and require shift supervisor approval prior to approaching the sensing lines. A similar sign was also installed in another area where other critical reactor instrument sensing lines are accessible during operation.

Painting in and around these sensing lines was suspended until the next refueling outage. Painting and scaffolding procedures were revised to also require operations, system engineers and I&C, to identify critical sensing lines in addition to critical instrumentation prior to beginning work. Appropriate work instructions to workmen are then generated as a result of the review.

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Discussion of this event will be included in technical staff training. A description and results of the testing performed has been sent to other utilities for information. The modification process has been revised to include considerations for protecting critical instrument sensing lines.

ADDITIONAL INFORMATION

Failed Component Identification

There were no component failures associated with this event.

Previous Similar Events

Reportable Event 89-038 involved a spurious signal from the B high pressure switch while a half scram was inserted in the A channel of the reactor protection system during a surveillance test. The cause of this event was identified as a bump to the B pressure switch. It is probable, based on the findings of this LER, that the cause for this previous event was incorrectly analyzed. The previous event occurred immediately following a refueling outage and cleanup work was in progress throughout the reactor building. It is probable that the sensing line was bumped but was not identified as the cause of the reactor scram because the pressure switch is located on the floor below the sensing line and the sensitivity of the sensing line was not understood. The pressure switch was identified as being highly sensitive to bumping, however, and work was identified in the switch location. It was, therefore, believed that the pressure switch had been inadvertently bumped. Because of the previous incorrect analysis, the corrective actions for LER 89-038 were not appropriate for avoiding the October 29, 1990 scram.

ATTACHMENT 1 TO 9012050132 PAGE 1 OF 1

Northern States Power Company

414 Nicollet Mall
Minneapolis, Minnesota 55401-1927
Telephone (612) 330-5500

November 28, 1990 Report Required by
10 CFR Part 50, Section 50.73

Director of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, DC 20555

MONTICELLO NUCLEAR GENERATING PLANT
Docket No. 50-263 License No. DPR-22

Reactor Scram Caused by Bumping Instrument Sensing Line

The Licensee Event Report for this occurrence is attached.

This event was reported via the Emergency Notification System in accordance with 10 CFR Part 50 Section 50.72 on October 29, 1990.

Please contact us if you require additional information related to this event.

Thomas M Parker
Manager
Nuclear Support Services

c: Regional Administrator - III NRC
Sr Resident Inspector, NRC
NRR Project Manager, NRC
MPCA
Attn: Dr J W Ferman

Attachment

*** END OF DOCUMENT ***
